

she

Biological
& Medical
Serials

alie

T

..THE..

LIBRARY

OCT 24 1942

Ophthalmic Record.

G. C. SAVAGE, M.D., Editor and Publisher.

Biological
& Medical
Serials

A DEPARTMENT OF

◊ LARYNGOLOGY, ◊ RHINOLOGY ◊ AND ◊ OTOTOLOGY, ◊

Edited by GEO. H. PRICE, M.D.

● ● PUBLISHED MONTHLY. AT \$2.00 PER YEAR. ● ●

ENTERED AT NASHVILLE POST OFFICE AS SECOND CLASS MATTER.

Vol. IV.

Nashville, Tenn., July, 1894.

No. 1.

...CONTENTS...

The Prevention or Modification of Astigmatism after Cataract Extraction, by L. B. Graddy, M.D	1
Cataract Extraction and Office Operation, by S. Mitchell, M.D	7
A Contribution to Refractive Correction, by John C. Morgan, M.D	11
Further Observation on the Eye of the Negro, by C. W. Kollock, M.D	15
Anisometropia, by C. M. Hobby, M.D	19
A Duction Indicator and Developer, by A. E. Prince, M.D	22
Two Cases of Ectopia Lentis, by L. D. Brose, M.D	25
A New Instrument for Measuring the Inter-pupillary Distance, by C. H. Perry, M.D.	26
Cataract Operations, etc., by R. O. Cotter, M. D	28
A Case of Chorea cured by Glasses, by A. G. Aldrich, M.D	30
Analysis of the Relations of the Double Images in Paralysis of the Ocular Muscles, by George T. Stevens, M.D	31

EDITORIAL:

American Medical Association	33
Volume IV, of THE RECORD	34
Anomalies of Refraction and of the Muscles of the Eye	35
Dr. W. T. Briggs	35
Eye and Ear Clinic	35

Department of Laryngology, Rhinology and Otology.

Tansley's Cut to prevent Mastoid Trouble, by Wm. D. Babcock, A.M., M.D	36
A case of Antrectomy for the relief of Catarrhal Deafness, by W. H. Bates, M.D.	38

FARBENFABRIKEN VORM FRIEDR BAYER & CO
PHARMACEUTICAL PRODUCTS

Piperazine-Bayer

ANTILITHITIC AND URIC ACID SOLVENT

For LITHIASIS, acute and chronic gout and the uric acid diathesis generally, no remedy has succeeded so well as Piperazine. In Renal Colic and Hæmaturia, also, it is efficacious. PIPERAZINE-BAYER is made by a new process whereby its cost is greatly reduced. Piperazine-Bayer is supplied in *half* and *one ounce vials*, also in *tablets*. In painful conditions it may be combined with Phenacetine-Bayer.

LOSOPHAN

or TRIIODOCRESOL is indicated in Mycotic, Fungoid or Parasitic diseases of the integument. It has given excellent results in the treatment of ring-worm, scabies, pityriasis versicolor, the chronic forms of eczema, prurigo, sycosis vulgaris and parasitica, acne, rosacea and pediculosis. LOSOPHAN is employed in 1 to 3 per cent. alcoholic solutions or ointments. It is *supplied in ounces only*.

SALOPHEN

In Acute Rheumatism, Salophen has been strongly recommended by competent observers as the most energetic and eligible remedy now employed for that malady. Salophen is a salicylic derivative of a non-toxic phenol. Salophen is supplied in *ounces, tablets and pills*. In very painful conditions, and in influenza, Salophen may be given in combination with equal parts of Phenacetine.

ARISTOL

Is widely employed as a convenient, agreeable and effective dressing in major and minor surgery, dentistry, inflammatory conditions of the eye, ear, nose and genitalia, ulcerations and burns. Aristol adheres closely to wounds and membranes. Aristol may be used dry, or in the form of 10 per cent. ointments, oils, colloids or ethereal solutions. *It is supplied by us in ounces only.*

TRIONAL

is a nerve sedative and hypnotic which has given very satisfactory results in cases not benefited by other drugs. It is valuable in simple agrypnia, in mental excitement and delirium accompanied by obstinate insomnia, and in narcotic habitués. It acts promptly, safely and effectively. Where pain is present Trional may be given conjointly with Phenacetine. Dose 15-30 grains. *Supplied in ounces.*

AND

Europphen=Somatose=Sulfonal-Bayer=Phenacetine-Bayer

Pamphlets forwarded by

W. H. Schieffelin & Co., New York

THE OPHTHALMIC RECORD.

VOL. IV.

JULY, 1894.

No. 1.

THE PREVENTION OR MODIFICATION OF ASTIGMATISM AFTER CATARACT EXTRACTION.

By L. B. GRADDY, M.D., Nashville, Tenn.

Read before the Nashville Academy of Medicine, May 24, 1894.

A change in the curvature of the cornea, giving rise to unequal refraction in different meridians of the eye, more or less of which remains permanent, occurs in almost every eye after cataract extraction. This inequality in the curvature of the cornea may be observed before the healing process is complete. Indeed it begins as soon as the cut surfaces are united with sufficient firmness to offer any resistance to the pressure of the contents of the globe; and, continuing, reaches its maximum only when the resistance of the new tissue uniting the wound, becomes equal to the resistance of the surrounding tissue. At this time the new tissue begins to contract, and in many cases the reduction in the degree of astigmatism is remarkably rapid, until finally a point of permanency is reached. In nearly all cases there is a decided reduction in the degree of astigmatism before it becomes permanent, but very rarely does the cornea resume its normal curvature. In smooth operations, without accident to interfere with normal healing, the astigmatism is due to a stretching of the plastic material uniting the wound. Sections, therefore, smoothly made, which give the least gaping

during the low resistance period of the new tissue, will leave the narrowest scar and consequently furnish the lowest degree of astigmatism. It is admitted, I believe, that the more peripheral the corneal section, the greater the astigmatism is apt to be, hence I make all my sections distinctly corneal, *and do not turn the edge of the knife forward while finishing the corneal section.* Inclining the edge of the knife forward while completing the corneal section, as most operators do, is responsible, I think, for a large amount of the astigmatism, even when the section is entirely corneal and as smoothly made as it can be with the narrow knife. The small advantage gained in this way by enlarging the opening for the exit of the lens is more than counterbalanced by the evils resulting and the additional risk incurred. As the section approaches a line perpendicular to the plane of the cornea in a definite ratio it favors gaping of the wound, firm union is retarded, and prolaps or entanglement of the iris is encouraged, all of which contribute to the production of astigmatism. By reference to Becker's "Atlas of the Pathological Topograghy of the Eye," we observe that, after healing, the flap somewhat overlaps the stump. The flap bulges and rises while the stump sinks a little into the anterior chamber; the inner inferior edge of the flap is thus lifted up and meets the stump-lip above the line of normal union. This gives a narrow line of apposition, and as soon as the union is firm enough to offer any resistance to the pressure of the contents of the globe the external edges of the wound are separated, giving to the wound a wedge shape with the base outward; thus the vertical diameter of the cornea is lengthened, effecting a permanent change in its curvature. This may take place when the section has been made perpendicular to the antero-posterior axis of the globe—when a perfect flap has been formed, but not to the same extent. The observations of Becker and Norris* furnish an argument, I think, in favor of the flap operation

* Transactions A. Med. Ass. 1887.

L. B. Graddy, M.D.

made with a broad knife, but especially against inclining the edge of the knife forward while finishing the corneal section. The superiority of the smooth flap made with a broad knife over the present method of operating is so pronounced that I am inclined to the opinion we are near another turning point in this important operation. The technique is more difficult, it is true, but I believe surgeons at present hold aloof from the broad knife more because of the disastrous results which followed in its wake at a time when the present high state of our art and antiseptics were not dreamed of, than because of the slight difficulties to be overcome in its use. I think it is a question of only a short time when we shall all return to the broad knife and the classic flap operation, slightly modified. I have recently had a knife made which I have used in a few cases and find very satisfactory. The general shape is that of Beer's knife, but the essential points of difference are important. The blade is as thin as it could be made consistent with the requisite degree of strength, and of the same thickness at corresponding points throughout its length. A cross section of the blade shows it to be of single wedge shape with rounded back. For a distance of three sixteenths of an inch back from the point, it is double edged. Owing to the shape and thinness of the knife, when well sharpened, it glides through the corneal tissue with but little more pressure than is required by the Graefe knife; but in the use of the broad knife, the pressure is constant "from start to finish," instead of spasmodic as is the case in the to and fro movements of the narrow knife. The advantages of the broad knife are: it leaves the cut surfaces smoothly sliced throughout the section; whereas the narrow knife leaves irregular, undulated surfaces which do not fit into each other when the flap rides the stump. The broad knife enables us, with care, to lay the whole section perpendicular to the antero-posterior axis of the globe. The smoothly sliced section made with the broad knife is a great gain. There is less

gaping of the wound, consequently less danger of infection, union is more rapid and firm, owing to better apposition and broader surface; there is less riding of the flap, and less astigmatism.

While much may be done to prevent a high degree of astigmatism by making the section distinctly corneal with a broad knife, perpendicular to the antero-posterior axis of the globe, still there will follow a sufficiently high degree to prove very embarrassing to vision unless corrected. The question, then, arises: Can we further modify or prevent astigmatism by any other means? I think we can. The modification of astigmatism by nature's processes after cataract extraction from its highest degree to one of permanency, is not, I think, by cicatricial contraction alone; but by cicatricial contraction aided largely by lid-pressure. The bulging flap, the faulty point, is favorably situated to receive constantly the greatest pressure the eye-lids are capable of making upon the eye-ball; and the decline in the astigmatism is, as a rule, too rapid to be due wholly to cicatricial contraction.

If lid pressure has anything to do with the production of astigmatism in eyes that have not been operated, it must have a great deal to do with modifying astigmatism produced by traumatism. Believing that lid pressure played an important part in the retrogressive process of astigmatism after cataract extraction, it occurred to me that both cicatricial contraction and lid pressure might be materially assisted by means of the pressure bandage. This aid I concluded could be made effective only after the wound had become firmly healed, but that it should be rendered while the new tissue in the wound was yet compressible. With these views I began the work about two years ago set forth in this paper. It is imperfect, I know, but it furnishes a basis upon which the work may be elaborated. In order to make the tests as convincing as possible I used alternate eyes, excluding from the test all eyes in which any acci-

dent occurred during or after the operation to interfere with normal healing. I have now treated ten eyes, with a view to modifying or preventing astigmatism, alternately with ten eyes treated in the usual way, with the results given below. The patients varied in age from fifty-two to seventy-six years. The operations were all made without iridectomy, and as already said, in no case was there any accident during or after the operation to interfere with normal healing. The sections were all made distinctly corneal with a narrow knife, as near as possible at corresponding points, perpendicular to the antero-posterior axis of the globe, thus forming a flap as nearly identical with the old operation as could be made with the narrow knife. A light dressing was put upon all (20) cases, and the patients permitted to sit up or lie down as they felt inclined. In all (20) cases the light dressing was permanently discarded on the tenth day. In ten alternate cases when the light dressing was discarded, the conjunctival sac was irrigated with a boric acid solution (saturated), the eye-lids and brow were bathed with sublimate solution—1:2000—and a dry cotton compress and roller bandage firmly applied and not disturbed so long as the bandage retained its position. The eyes were kept bandaged twenty days. The refraction was tested in all—20 eyes—on the thirtieth day after the operation.

Of the bandaged cases:

4	had	2.	D. @ = 8
2	"	1.	D. " = 2
3	"	0.5.	D. " = 1.5
1	"	0.0.	D. " = 0.0
<hr/>			

In 10 eyes a total of 11.5. D.

Of the unbandaged cases:

2	had	5.0.	D. @ = 10.	D.
2	"	3.5.	D. " = 7.	D.
3	"	3.0.	D. " = 9.	D.
3	"	2.75.	D. " = 8.25.	D.
<hr/>				

In 10 eyes a total of 34.25. D.

The ten cases treated with a view to preventing or modifying the astigmatism shows an average of 1 15-100 D. of astigmatism thirty days after the operation; while those which were permitted to take the usual course show an average of 3 47½-100 D.; the astigmatism being less than one third as great in the treated cases as in those which were not treated. The whole twenty cases were re-examined in from eighty-seven to ninety-eight days after the operation, when it was found that the total astigmatism in the ten bandaged cases was 6.75 D. and in the ten unbandaged cases 23.25 D., the reduction being, as we might expect greater in proportion in the unbandaged cases, but still leaving the latter with an average of nearly 2.5 D., while the former showed only a fraction more than 0.5 D. The astigmatism will doubtless further decline, but it has not been practicable to follow the cases further.

The degree of the astigmatism in the whole twenty cases was determined by means of the test glasses, verified by retinoscopy. The ophthalmometer would probably have shown a higher degree, but the findings of that instrument, according to Weiland, Burnett, and Edward Jackson, in aphakic eyes, are not reliable.

By reference to the above tables it will be observed that the astigmatism was less in the unbandaged eyes than is commonly found thirty days after extraction of cataract. That I think was due to two causes: 1st. To the character and location of the corneal section, and 2nd, to the fact that they were selected cases—cases in which we should not expect a high degree of astigmatism.

Opinions still differ somewhat in regard to the application of a pressure bandage to an eye as a dressing after extraction of cataract; the tendency is, however, to discard such dressings absolutely. I know of no other experience than my own with the bandage, applied after closure of the wound, with a view to modifying or preventing astigmatism. In a paper read before

the Am. Med. Assoc., in 1891, in opposition to pressure as a dressing after cataract extraction, Dr. Edward Jackson says: "After complete closing of the wound there is a distinct tendency to bulging, which pressure, if it could be steadily applied to the point of deficient resistance, and to this point alone, might influence beneficially. But such pressure is manifestly impracticable." So far as the paper shows, this opinion which implies that pressure, unless steadily applied to the point of least resistance would prove worthless, was not based upon practical experience. Direct pressure steadily applied to the point of least resistance is impracticable, but my experience proves that such use of pressure is not necessary to the achievement of valuable ends. Whether it would be better to apply the pressure earlier or later than the tenth day, and to continue it for less or more than twenty days must be settled later. I heartily join in the severest condemnation of the pressure bandage as a dressing after the extraction of cataract; but that pressure can be usefully employed after complete closure of the wound, in modifying and preventing astigmatism there can be no doubt.

CATARACT EXTRACTION AN OFFICE OPERATION.

By S. MITCHELL, M. D. Hornellsville, N. Y.

Oculist and Aurist to St. James Mercy Hospital, Consulting Surgeon to The Hornell Sanitarium.

About a year ago, during a conversation with Dr. Lucien Howe, relative to the care of patients after cataract extraction, he remarked that he thought the day not far distant when the ophthalmologist would consider cataract extraction a suitable and safe office operation.

At that time I did not concur in this opinion, although I was then making nearly every operation upon the eyes, office opera-

tions, except cataract extractions. But this, the capital operation of eye surgery, I did not think would ever be brought to the plane of tenotomies, plastic and lid operations, and the other minor affairs that go to make up the daily routine of the oculist's duties, and bring some diversion from the unvarying round of refraction work, with the same old, old story of eye-ache, headache, smarting lids, etc.

But in the light of a recent experience, the particulars of which will be related farther on, I have changed my mind somewhat in this regard. And can now see no reason why simple extraction, in the majority of cases, should not be performed in the office and the patient walk or ride to their home or boarding place afterwards.

Certainly the office of the oculist is, or should be, much more conveniently arranged as regards light and appliances, than is, or can be arranged, the room assigned to cataract patients in private dwellings or boarding houses.

Who has not had their ingenuity severely taxed to provide an operating table of suitable height and size, when about to operate at some private dwelling? The head of the ordinary couch, found in most houses, is too high to allow one to sit and operate, and too low to admit of standing while operating, and the dining table is too unwieldy to bring near enough to the window to secure good light. I have frequently made use of the couch while operating by perching myself upon a chair in which was placed the old family bible, or a large dictionary. Thus elevated, my shoulders would be brought up to the proper height for ease in operating.

In many farm houses I have found a low, narrow, old-fashioned lounge, whose joints, loosened by age, would permit the removal of the head-board, and thus a very suitable appliance has been provided, just the proper height for operating while sitting. By no means the least unhandy of all the appliances that I have been called upon to devise for an operating table in

cataract extraction, was an ironing-board, placed upon two chairs. Verily, "necessity is the mother of invention." But to return to the case referred to in the beginning of this paper. It was a case of simple extraction, on an old gentleman eighty-five years of age. His cataracts had been very slow maturing and he was very anxious to be rescued from his semi-blind condition.

The day set for his operation proved to be quite dark and rainy, and as the room assigned him at a boarding house near my office was poorly lighted, I decided to operate in my office. The operation was done under the use of cocain without iridec-tomy. A few drops of a one grain solution of eserine was in-stilled into the eye and both eye bandaged.

I accompanied him to his room which was about a half block from my office, and up two flights of stairs, where I left him seated in an easy chair, with the room only darkened by a light window shade (I gave up keeping cataract patients in a *dark* room and in bed, several years ago). His recovery was un-eventful, and at the end of the first week he was visiting my office two or three times daily. At the end of the second week I again operated upon his eye at my office, performing discis-sion of the opaque capsule with a knife-needle securing imme-diately a large, clear, central pupil.

The day following the discission his vision was 20-70 with $-6.50 \text{C} + 8 \text{Cyl. axis } 165^\circ$. Although this is my first office op-eration for extraction of senile cataract, I have made discission of secondary or membranous cataracts, also discission for the solution of soft cataracts, office operations, for some time past.

I one case, where I performed discission for secondary cat-aract one month after the extraction, for a gentleman sixty years of age, he immediatedly after the operation returned to his home seven miles distant in the country, alone in his car-riage, and I did not see him again for several weeks. When he returned for his glasses, vision with a $+9.50$ was 20-15.

I have recently performed simple linear extraction in one case, and extraction of soft cataracts by suction on three different occasions, all as office operations, the patient walking or taking the trolley car to their dwelling places after the operation, and returning to the office the following day for treatment. In no instance was there any interruption to a speedy recovery.

The apparatus used in the suction operations, is a very simple contrivance, and although the idea is not new, I think the material used in its construction, and in just this application presents something of a novelty. Perhaps I am the first to make the application. It consists of a glass pipette, with a slim, nicely tapering point, the edges of the glass at the point being rounded by heating it in a gas flame. Over the other end, usually occupied by the rubber bulb, is stretched one end of a piece of rubber tubing about two feet long, and the apparatus, costing the insignificant sum of twenty-five cents, is complete and ready, with a little assistance from the operator, to accomplish the most important part of the operation. My method of operating is to open the anterior chamber at the temporal side with a keratome, making an incision in the cornea about seven millimetres long, the same as for linear extraction. A toothed cystitome with a sharp blade, two and a half millimetres long, is then introduced, the capsule opened freely and the substance of the lens thoroughly broken up. Taking the free end of the rubber tube in the mouth, the point of the pipette is introduced into the anterior chamber until it reaches the center of the pupil. Then by suction the air in the tube and pipette is exhausted, and the soft lens matter cannot do otherwise than quickly jump into the body of the pipette. I never move the point about under the iris in search of pieces, but content myself with taking all that can be secured at the centre, which is generally the major portion of the crystalline. A subsequent

needling to incise the posterior capsula, is usually all that will be required to give good vision.

I have a patient now under treatment, a German boy, fourteen years of age, with congenital cataract. He now has in the right eye with $+9.50$ lens, vision of $\frac{20}{1}$ through a pupil in the centre of a partially absorbed soft cataract. This is the result of a suction operation first, and then four weeks later a simple discission of the capsule, where it was exposed in the centre, gave a nice, clear pupil and vision as above recorded.

On the 21st of May last I operated upon the left eye, using the suction apparatus, as described above, and removed nearly the entire lens. At the present writing (three days after the operation) there has been but very slight reaction, and absolutely no pain. The pupil is quite clear, and vision is $\frac{20}{c}$. There is a thin capsular membrane that may require discission to give good vision, although there is quite a rent in the capsule now, caused by the pressure of the vitreous as the lens matter was removed.

The reaction following all of my operations of this sort, has been no more severe than after simple discission, and the patients have been spared the ordeal of several operations. Although slight, they are nevertheless looked forward to by the recipient with anything but pleasure, and vision is secured without tedious months of waiting.

A CONTRIBUTION TO REFRACTIVE CORRECTION.

By JOHN C. MORGAN, M. D., Philadelphia, Pa.

To begin with I would invite attention to some evils attending the use of *one pair* of glasses for distance, and for close work. Firstly, the lateral and vertical *centering* of the lenses for the one purpose necessarily differ from that for the other; and any attempt to compel the eyes to adapt themselves to a

common centre for both, is necessarily futile, if perfect central refraction be, as it is, important. Mere mention of this should suffice to show the impropriety of this common practice. Another objection to the same is that, whereas distant vision requires the lenses to stand almost vertical, close work demands a considerable tilt of these, even when identical plus numbers are indicated. That failures are largely related to such conditions is apparent. A third objection applies, where distant vision requires concave glasses; particularly if the two eyes be different, and the organism, with the power of accommodation, feeble. The effort required to overcome the dispersion of rays by the glasses, is considerable; and the effect decidedly morbid. Plus lenses instead, are needed for reading, most frequently.

Again, all *bifocal glasses* are open to serious criticism. The first point is self-evident, viz: that in *walking* one must look through the lower, the reading lenses, almost to the exclusion of the upper, or distance glasses, producing confusion, and sometimes vertigo.

The second is that this is made worse by the convergent centering required for reading, etc., is inimical to such distant use of the lenses, unless it be that the nearly parallel outlook of the eyeballs at the distant pavement can escape from interference by the reading lenses altogether.

A third objection is that, unless the main lenses are provided with *two centers*, the calculated refraction will necessarily be false for close work. A lens centered for distance, and in a vertical position, does not add its exact central refraction to the near glass cemented to its lower periphery! Something very different results; and this means an astigmatism due to the "corrective" glass; no doubt, a prolific source of failure. This *astigmatism of the lens* is duplicate; being due to both a defective reading centre, and the vertical (practically oblique) position of the lenses.

The only way to perfect results in bifocal glasses seems to be in making the distant lenses separate, as of old time, from the near; the former, nearly vertical, and centered for distance, only; whilst the near glasses should occupy only the inner and lower segments of the (spectacle) frames, independently centred for convergence, to the ascertained degree needed for reading; and (a more difficult undertaking) *tilted*, for the special lines of close vision. Failing in these requirements, perfect bifocal glasses seem to be impossible. Besides, the near lenses, with one surface fully corrected, *per se* should be cemented, by a plane surface; and if this be impracticable, there must be entirely distinct pieces, separated by a line, as of old, from the distance glasses. In any case the near correction should be absolutely independent of the other. Furthermore, the frames for near work should be arranged for convergence of the eyeballs; but in one plane, for distance.

None of these observations are made from any mere theoretic views, but all have sprung directly from practical experience.

Germane to this subject, in the proper adjustment of the *clips* now so commonly used to fix eye-glasses. Not only should they perfectly fit the individual nose, but also, the relative pressure of their upper and lower ends must be exactly graduated. Particularly, the principal hold is to be given to the *upper end*. Thus, the outward displacement of that end, so annoying to the wearer, is prevented; whereas, a plus of pressure at the lowest end of the clips causes the evil referred to.

Once more, a complex correction, as for astigmatism coupled with presbyopia, both requiring strong convex lenses, as for reading, may give rise to *double vision*, by prismatic action, thus: X, a straight line being used as a test. This must be examined and further corrected, by added prisms; dividing the addition between the two eyes, in the usual way, in making the prescription.

Still further, the lenses should, in all cases be of *good diame-*

ter, not only for cosmetic reasons, which are important, but also because vision is strained in using a lens which constantly forbids every slight excursion of the eyeball, brings its edge frequently to, or within the line of sight. This is the more annoying, when the lens is enclosed by a metallic rim, and also even when metallic fastenings encroach upon a marked lens.

IRRITABLE ACCOMMODATION.

As atropia and the like produce unpleasant effects, at times, much has been said and done, looking towards their disuse. Irritable accommodation, however, often requires special control in order to fit glasses at all. Not infrequently, systemic and mental causes promote a spasmodic ciliary, or a muscular paralytic state. These are amenable often to relief, and even to cure, by simple and unobjectionable measures.

Firstly, a series of preliminary instructions are useful. These are:

1. Let the visit be in the forenoon, before general and local fatigue has set in.

2. Avoid *studying* the answers to test-glasses; a studied answer is likely to be worthless. The reply should always be instant and off-hand.

3. Remember that the successive lenses placed before the eye are commonly but very slightly different in strength; therefore, do not stop to puzzle over that fact, but, as before said, answer "better," or "worse," instantly.

4. Do not *try* to see anything; let the seeing be altogether involuntary, as it were.

5. Close the eyes, in a quiet way, the moment the answer is given, *every* time, without telling; keep them gently closed, until again directed to look.

The oculist, however, is to remind the patient of these points as frequently as need be. In addition, the *mydriatic of darkness* is to be further invoked, by always having the patient's seat in a dark corner whilst the test cards are well illuminated.

DRUG EFFECTS.

Refraction is greatly influenced through innervation and nutrition by drugs. Hence correction is most satisfactory when made after all drug action has ceased.

THERAPEUTICS.

Certain drugs, in minimum, that is, in "alterative" doses, and given singly, have proved their value in many instances, in the relief of some of these troublesome conditions. Among them, *Santonine* has signalized its utility in some cases. *Cinchona*, when there is anisometropia; the right eye having, in my experience, usually, the shorter focus, using the date-line of a newspaper as a convenient test. Such cases are often convalescent from parturition, or from acute diseases, who have too early and unduly taxed their eyes.

Cimicifuga is related to nervous and rheumatic troubles; *physostigma* to progressive myopia; Argent nit, and *Lilium tigrinum*, to functional astigmatism, etc.

Apart from the subject of refraction, a word as to the therapy of *Glaucoma*. Two drugs seem especially *en rapport* with this affection. If acute, with sharp violent pains, *Spigelia*; if sub-acute, with dull pains, *Pulsatilla*. If there be periosteal tenderness and pain, *Mercury* may be considered in addition.

FURTHER OBSERVATIONS ON THE EYE OF THE NEGRO. *

By CHARLES W. KOLLOCK, M.D., Charleston, S. C.

In a former paper on this subject, it was concluded that the eye of the negro had deteriorated since he became free, and that this was due to the following causes: 1. To syphilitic infection; 2. Lack of good and sufficient food and clothing; 3. Total disregard of sanitary and hygienic surroundings; 4. Fre-

* Read in the Section of Ophthalmology, 1st Pan-American Medical Congress, Washington, D. C., 1893.

quent sexual intercourse with whites of low condition, which has produced a race—the mulatto—that have inherited all the weaknesses of both races, and hence are rarely healthy, but are generally syphilitic, scrofulous, and tuberculous; 5. Education implanted upon such a rotten foundation has produced its ill effects, such as myopia and attendant evils. Syphilis has caused wide-spread destruction among them, and it is not an exaggeration to repeat that but few remain who do not show symptoms of infection. The eyes especially have suffered from this disease, and blindness is increasing rapidly. Ignorant and careless of consequences, they rarely consult a physician when the disease is in its incipiency, so that when seen iritis is usually well advanced, synechie firm, pupils occluded, and general inflammation of the uveal tract, and choroid is not unusual. When there is keratitis, and this occurs in 37 per cent. of all their diseases of the eye, ulcers have extended over the cornea, and eaten into the layers proper, and perforation is the rule. When it is realized that so large a per centage have keratitis in some of its forms, and that they rarely seek advice until serious injury has been done, it is not difficult to understand how fast impaired vision and blindness are increasing. Kerato-malacia associated with xerosis of the conjunctiva is a frequent and interesting condition seen in negro children, and more commonly among the blacks than mulattoes. It is not often found in adults, and in Charleston has never been seen among the whites, though there are many who live in similar condition and who have like surroundings. There can be no doubt but that the disease is due to a lowered vital condition, and it usually occurs in weakly children from one to eight years of age. Some show undoubted signs of inherited syphilis, others are scrofulous, and some tuberculous, with cavities in the lungs and deposits in the mesentery, while others do not appear to have any bodily affection, but all are night-blind, and this more than any other symptom induces the parents to bring them for treatment. It

has been thought that perhaps malaria was a factor in its causation, but examination of the blood has so far not proved anything worthy of note. The existence of a bacillus* has been suspected. The negro lives commonly on hominy (grits), rice, fish, and bad hog meat, and it is possible that the kind of food may have something to do with the condition. The whites do not eat as much fish, and the quality of hog meat is better than that used by the negro, who will frequently buy strong smelling meat in preference to that which has no odor. Treatment does much for those in whom the cornea is slightly affected, but it has been the experience of the writer that when the entire cornea breaks down and suppurates (gangrene), it avails little, and the patient soon dies. Malaria is undoubtedly a cause of keratitis among them, and when such is the case there will be periodic exacerbations. These cases are rapidly improved by large doses (gr. xx.) of quinine given at short intervals for several days in succession. But in all these cases of corneal trouble, specific treatment will be of great value. The negro is a curious being. He will sit, ax in hand, on a pile of wood and freeze to death; and he will hold a prescription which can be procured free of charge, and yet not have it filled. So that treatment is not always satisfactory: nor can you depend upon him to carry it out. But for certain things he has a predilection, and one of them is for "salves." Any greasy dirt that he can rub in will afford him pleasure. Therefore taking advantage of this weakness, it is best to begin treatment with mercurial inunction, than which there is no better. He will faithfully rub a drachm of this into his skin twice a day, and the results are magnificent—it is food and medicine, he responds beautifully, and the efficacy of drugs seems assured. They seem to bear mercury better than the whites, and inunction may at times be continued two weeks or longer. Conjunctival in-

* It is stated that the bacillus has been found by Dr. Weeks, of New York.

flammation of a mild character is more frequently seen among the mulattoes, but this may be due to the fact that refractive errors are more common with the latter, and also that they use their eyes more for trying work than the blacks do.

Trachoma is equally rare among both blacks and mulattoes, but undoubtedly occurs. Strange to say, ophthalmia neonatorum is not very common among them. The gentlemen who have done the practice for the poor in Charleston say that it occurs in the blacks less frequently than among the whites. Certainly gonorrhœa does not seem a very prevalent disease with them.

Recently two cases of leprosy have been seen in mulatto men by the writer. One man was about sixty years old, and the other twenty-five. No other members of their families were affected, nor were they related. Both had the nodular infiltration along the eye-lids, and the ciliae had dropped out. In the older man the diffused progressive opacification described by Hulanicki, was shown. It extended upon both corneæ from the upper margins to about the centers. The surfaces were smooth, there was no inflammation or photophobia, and the haziness was either between the conjunctival layer and Bowman's membrane, or involved the latter. In the younger man was seen the other mode by which the disease affects the eye—the nodular infiltration of the cornea. This Hulanicki says is seldom a primary affection of the cornea, but usually extends from the sclera. This patient had also some signs of syphilitic affection, as the bones of the nose had been destroyed by ulceration, but leprosy and syphilis seldom co-exist in the same person.

Refractive errors are met as commonly among the mulattoes as the whites, but as yet myopia is not quite as frequent in occurrence, though it is undoubtedly increasing. In the pure black refractive errors are the exception, myopia has never been seen by the writer, but as their education advances, they will at no distant date have the civilized eye.

ANISOMETROPIA.By C. M. HOBBY, M.D., Iowa City, Ia.

It is apparent that the discussion of many important points connected with the function of vision, and especially of those bearing upon our field of work as practical ophthalmologists, is obscured, rather than cleared up, by too close adherence to the consideration of the eye as an optical instrument.

The visual function is something more than the performance of the optical work of an apparatus with lenses, diaphragm and screen corrected, adjusted, (we cannot say "centered"), and focussed, though it may be in strict accordance with mechanical principles and dioptric art. The eye does not complete the visual process. Its work requires interpreting, like that of any other instrument, and the interpretation is essential to vision. Not only this, but we are compelled to believe that the interpretations are not instinctive, inherent, or mechanical, but (analogy still holds good) in accordance with experience. Binocular vision extends not only the field of work of the combined instrument, but enlarges the experience. The doctrine of identical points, in so far as it assumes that each particular point of the retina of one eye co-operates with a certain other particular part of the retina of the other eye, under the mutual domination of a single "high center," is not established, and its assumption, I think, leads away from the solution of practical problems concerning acuteness and ease of vision. The hypothesis that the coincident movements of the eyes in search of an object of fixation, external accommodation, etc., are governed by a mechanical apparatus like a Jacquard loom,

with a constant of tention for each particular element, seems even more foreign to the analogies of nature.

Anisometropia, or rather the suggestion of it, has been very remunerative to the itinerant spectacle venders, and has explained misfits in glasses and uncured asthenopias. A few years ago nearly every patient who had been struggling unsuccessfully with asthenopia was certain that his difficulty came from unequal refraction, and reluctantly accepted evidence that his eyes were nearly equal. I have reason to believe that anisometropia, while not rare is seldom of importance as a disturbing factor. In over 1,200 cases of error of refraction occurring in private practice and carefully noted, I found but 83 with a difference between the eyes of more than 1.00D.

While the proportion of asthenopic cases in the general collection was 58 %, in the anisometropic cases it was less than 52 %, showing that the difference between the two eyes was an unimportant factor in the production of asthenopia; the thirteen cases of strabismus in the group accounts for the smaller percentage of asthenopia, since there is rather less asthenopia amongst the older strabismus patients than amongst others having equal refractive errors. Thirty-six were hyperopic, thirty-seven were myopic, and ten were hyperopic in one eye and myopic in the other. Until about five years ago, the doctrine of judicious compromise was followed in the treatment of these cases; latterly the most perfect correction possible was made for each eye independently, and the patient directed to keep the glasses on, regardless of discomfort, for three weeks; a few were assisted by a week of thoroughly paralyzed accommodation; few required any assistance, and I believe all are wearing at the present their complete correction with comfort.

These results indicate that when custom establishes toleration, the different sizes of the retinal images, and the necessarily different shapes in some cases, are assimilated by experience, accepted by the brain, and used in intellection, with no

more cognizance of the difference of the images than there is of the retina as a fact. In addition as any considerable amount of ametropia frequently results in *amblyopia ex anopsia*, if this term may be stretched over those cases where imperfect vision is the result of absolute inexperience with perfect retinal images, it is important that visual correction should be sought as early as possible. To obtain the greatest acuteness of vision, binocular as well as monocular, in anisometropia the three following rules have seemed to me of great importance.

First: Complete correction of errors of refraction. For reasons given elsewhere, it is better in children to correct the corneal astigmatism as indicated by the ophthalmometer rather than the amount subjectively determined.

Second: The correction should be worn constantly. The patient should at no time remove the glasses to look at objects, and children should be guarded against looking over or to one side of the glasses. Experience shows that the mental habit of best use is developed by enforcing this rule absolutely, then after a few days, or rarely weeks, objects will appear correct in size, shape, and position; while, if the glasses are laid aside occasionally for a few minutes, more discomfort will be felt, a longer time will be required to establish the mental habit of use, and this result may be defeated. This statement is made from the results of experience, and it is fortified by numerous observations of tolerance of glasses totally unsuited to the patient's use. If the eyes will bear without injury to the optical apparatus, and even without discomfort, glasses which are entirely wrong, and which increase the refractive error, I think we may drop our apprehension of injury when we succeed in getting a perfect image upon the retina, and trust the brain to assimilate two of them, so much the better, if assimilation be at all possible.

Third: Training the eyes, separately and together. The tone, vigor, alertness, and co-ordination of muscular movements are

developed, improved, and increased, by use, not by rest; and in all cases of anisometropia ocular gymnastics should constitute a part of the management; and this is especially necessary where strabismus is associated with anisometropia. In such cases ocular gymnastics is at least as important as correction of the refraction, and the two enable us not only to overcome squint, but to restore and maintain binocular vision in a much larger proportion of cases than is generally accepted.

A DUCTION INDICATOR AND DEVELOPER.

By A. E. PRINCE, M. D., Springfield, Ill.

In view of the fact that every progressive ophthalmologist recognizes the importance of making the test for adduction, abduction, and right and left sursumduction, a factor in the examination of every case in which a disturbance of the equilibrium of the recti-muscles is suspected; and in view of the additional fact that these tests are too often omitted, owing to the time usually consumed in placing successively before the eyes prisms of various strengths, it has been my pleasure to request F. A. Hardy & Co., of Chicago, and Bonschur & Holmes, of Philadelphia, to construct an instrument to facilitate these observations.

The inconvenience and inaccuracy arising from the employment of individual prisms, has been appreciated since the original contribution of Graefe, and efforts to overcome the difficulty have repeatedly been made. The original instrument was that of Hershel, by which two prisms were revolved over one another. This was modified by Stokes, Snellen and Creté, and finally left in so imperfect a state that it never became popular.

The idea was taken up by Dr. S. D. Risley, of Philadelphia, who had a variable prism constructed, which, for mechanical and optical precision, is a source of admiration. His instru-

ment registers in a quadrant of a circle one and one-half inch in diameter, thirty degrees, owing to which, the graduations near the zero point, are very closely approximated.

This constitutes an objection which has been overcome by Dr. Jackson, by means of a third prism of fifteen centrads to be so placed in combination with two of seven and one-half centrads each, that the divisions are larger near the zero point, while at the same time he secures a series of thirty centrads in a semi-circle of rotation. Prisms have been mounted in series so that they may be passed in succession before the eye, to all of which, there is an objection arising from the decided increment of muscular contraction required at the point of transition from one prism to another. To avoid this objection, and at the same time, supply a means by which the character, as well as the quantity of tension exercised, may be at once apparent to the observer, I have suggested the improvement of the Risley prism by reducing the amplitude from thirty to fifteen degrees and substituting a pinion movement for the inconvenient movement at present employed. When the instrument is held before the right eye the particular muscular tension required to overcome the prism at each point in the circle is denoted on the circumference by the letters AD, AB, RS, and LS, to indicate adduction, abduction, right and left sursumduction.



The instrument is made after the pattern of my phorometer, published in the Archives of Ophthalmology of 1893, p. 372, and subsequently improved by Bonschur and Holmes, of Philadelphia, and is furnished with a convenient handle, which may be held by the surgeon or patient while making the observation.

The revolving prisms are of seven and one-half degrees, so that

a maximum of fifteen degrees is attained. In using the instrument for testing right and left sursumduction and abduction, no auxiliary prism is required, but in testing adduction, it is usually well to commence with a twenty degree prism, base out, before the left eye. This secures a range from five degrees to thirty-five degrees, which is increased to fifty degrees by placing a fifteen degree prism before the right eye.

The ratchet pinion is placed at an angle of forty-five degrees with a radius passing through the zero point, so that when held by the physician or patient before the right eye, the pinion is always accessible, and the result so readily obtained that the tests are employed in cases in which they would otherwise often be neglected.

The instrument is scarcely less valuable as a developer of the strength of the muscles, which may be exercised daily to a greater and greater degree.

Hoping that the profession may find it useful and convenient, the instrument is herewith submitted for criticism.

TWO CASES OF DOUBLE SIDED ECTOPIA LENTIS.

By L. D. BROSE, M.D., Ph.D.

Oculist and Aurist, St. Mary's Hospital, Evansville, Ind.

Following Sippel, I use this term to designate congenital lens displacement, and in contradistinction to displacements which occur after birth, through disease or traumatism. Anomalies of this kind are not so very rare, yet when found in mother and child are worthy of being placed on record. September 18, 1893, Amelia Kart, 14 years, was brought to me with a history of having been near-sighted all her life. With the left eye, distant vision was limited to counting fingers at three feet; and with the right eye, the same at two feet. With the left eye she could read none of Snellen, while with the right eye she read

read Snellen II at four inches poorly. The eyes were normal in size and with perfect movement and form. The anterior chamber, however, was of irregular depth, the lower half being deeper than the upper, and with movement of the eye-balls there was tremulousness of the lower portion of the iris. After dilating the pupils with atropine and illuminating it with the ophthalmoscopic mirror, the dark border of the lower edge of the lens could be seen occupying the upper third of the pupillary space. Approaching to within twelve inches of the eye, two distinct images of the fundus were obtained, the one a true, distinct image and seen below the lens, the other an indirect or inverted image, and seen through the lower portion of the lens occupying the upper post-pupillary space. Although the patient was not aware of seeing double, still a true monocular diplopia could be occasioned by bringing a lighted candle to within a short distance of the eye. The projection of the image seen without the lens was correct, while the projection of the image seen through the myopic lens portion of the pupil because of the prismatic action of the dislocated lens body was contrary and false. There were no opacities in the lens nor malformation either in this body or in the fundus oculi. With a plus 10.D. spherical lens vision in the left eye was brought up to $\frac{15}{L}$ for the distance, and with a plus 15.D. spherical to reading Snellen II fluently. The right eye in the distance could be made to read with plus 9.D. spherical $\frac{8}{C}$, and in the near with + 15.D Snellen IX poorly. The mother, a woman 39 years old, who accompanied the daughter, seeing how much improvement was obtained by the adjustment of the proper glasses, next spoke up saying that her own eye-sight had likewise always been bad. With the right eye she read $\frac{2}{LXX}$ and with the left eye $\frac{15}{C}$ for the distance, while near she could read none of Sn. with right eye, and with the left eye very poorly Sn. 1 at five inches. After dilating the pupils with homatrophine, both lenses were found displaced upwards and slightly outwards,

after the manner in the daughter's case. Vision in the right eye could be but little improved, while in the left eye with $0.5 \text{ } \subset - 4.00 \text{ cyl. ax. } 180$, it increased to $\frac{15}{XL}$ for the distance and with $+ 3.00 \text{ cyl ax } 90$ to Snellen I at six to eight inches fluently. Inquiry into the family history elicited that both her father and mother had had good eye-sight; one brother, however, who died at 27 years, had weak eyes. The cause of congenital lens displacement has, and undoubtedly correctly so, been attributed to an irregular development of the suspensory ligament. Other embryonal developmental anomalies are not infrequently associated with it, such as microphthalmos, coloboma of the iris, choroid and lens itself. A fact of considerable interest in the present cases is that the anomaly reproduced itself in the offspring so similarly that the right eye, just as in the parent, could be given so little vision while the left eye could be improved so very much. Save in the way of adjustment of proper glasses, either with or without an indectomy, we are powerless to improve this condition.

A NEW INSTRUMENT FOR MEASURING THE INTER-PUPILLARY DISTANCE.

By C. H. PERRY, M.D., Oncida, N. Y.

The measurement of the distance between the optical centers of the two eyes, for the purpose of locating the centers of correcting lenses, made in the usual perfunctory way, seems generally to answer well enough, but in many cases where an unusually thick lens is prescribed or in cases of oblique astigmatism, it is believed that better practical results would follow an accurate measurement.

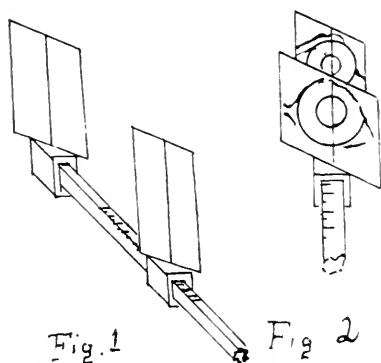
The writer has been using, for the past year, a very simple but very accurate instrument for this purpose, and is led to call the attention of the profession to it, by reading in the last num-

ber of the Archives of Ophthalmology, a description of an instrument for the same purpose by Dr. S. J. Bumstead.

The device which is the subject of this article, consists of a small, square steel rod, surmounted by two plane mirrors, each one inch square. One of these is rigidly fixed to the rod and the other slides thereon. The plane of each mirror is vertical, and cuts the axis of the rod at an angle of 45° .

The rod is graduated to show the distance between the centers of the mirrors, and through each of these centers, a vertical line is drawn, with a sharp tool, through the amalgam to the surface of the glass.

Fig. 1. shows a perspective view of the instrument and Fig. 2 an end view, as seen when in use.



To use the instrument the operator sits at the right of his patient and directs him to look at some distant object, or at a near one, if the measurement is to be taken during convergence. He holds the rod horizontally before the patient's eyes and low enough to allow the pa-

tient to look over the mirrors, with his own eye on a little higher level than those under examination, in order to see into both mirrors.

He then moves the instrument into such a position as to see in the fixed mirror a reflexion of the patient's left eye, and slides the movable mirror on the rod until it reflects the image of the right eye, directly under the image of the left, the vertical lines in the two mirrors being coincident and passing through the centers of the two pupils. The required distance is then read off on the graduated scale. The whole operation is finished in a few seconds and the operator depends on his own eye, instead of on the answers of his patient.

BARNESVILLE, GA., May 5, 1894.

EDITOR OPHTHALMIC RECORD:

Dear Sir: As my business duties prevent not only the pleasure I formerly enjoyed in writing for the journals, but also so fully occupy my time that I have little time for professional work, yet in spite of the unpleasant fate of having the presidency and management of a banking institution forced upon me in consequence of the death of a relative a year and a half ago, I still enjoy reading the journals, and take comfort in the prospect of being able in the near future of resuming my place in the ranks of my loved profession, which is dearer to me than any such Shylock-appearing occupation as money-lending. I manage to steal time to do an occasional operation, and I have been impressed with the fact that when we do but little, how much better we can do for our patients.

As I haven't read a great deal lately, I hardly know what is going on. I understand that it has gotten to be the fashion to give the patient, after cataract, more and more liberty; operating on them at the office and sending them home in hacks; doing the operation with the patient in a sitting posture; dressing with hardly any bandage, etc., etc. I have never yet done anything of this kind, and hardly think I ever shall. Cataract is, in my humble opinion, too much of a capital operation of the eye for such chances to be taken. But as to the time of dismissal of the patient: In the last three cases of extraction made by me I was so fortunate as to have such perfect union and rapid recovery that I sent one old man, aged seventy-six, home in ten days after the operation, with the eye perfectly free of inflammation, and inside of thirty days he had resumed his occupation

of driver (mail carrier). The second, an old man of eighty-one I sent home with the eye free of inflammation, in fourteen days. The third case, and the one most free of even redness of the eyeball, was an old man, eighty years old, whom I sent home on the eighth day after the operation. This may sound rash, but my reason for risking his removal was because he had no control over his bladder and bowels, and realized that he was such a heavy care to the people he was stopping with in town that I saw he was fretting to go home, and seeing that his eye had healed perfectly, and the ball and pupil perfectly clear, I allowed him to go.

All these cases were successes and had good vision. I made in all an iridectomy, as I have tried the operation without iridectomy about a dozen times, and have decided that I can do better for my patients by making the iridectomy. I attribute my success and the rapid recovery in these cases to my plan of simply bandaging up the eye and then *letting it entirely alone*, except to place fresh pedget of absorbent cotton over the lids every day for five days. Not a drop of Atropia solution was put in the eye after the operation. Neither did I examine the eye until the sixth or seventh day. If they had paid, of course I would have had to do something else. I am sure I have seen many successfully performed extractions fail simply from the dropping in of Atropia solutions once or twice a day after the operation, all the asepsis I observed was to wash off the patient's face with clear water, and dip all the instruments used in boiling water just before operating. I hope to meet you, brother editor, and many others of our colleagues from this country at the International Ophthalmological Congress, which meets in Edinburgh, August 6th to 9th. As I expect to spend the summer months in study abroad, I count upon being there.

Fraternally yours,

R. O. COTTER.

A CASE OF CHOREA CAUSED BY GLASSES.

A. G. ALDRICH, M.D., Anoka, Minn.

In March, 1893, a gentleman brought me his little daughter, Maud H., aged nine years, to be treated for acute catarrhal conjunctivitis. It was a simple case, and as it responded immediately to the treatment, I gave the case no further thought. In four weeks she again appeared at my office; this time suffering from a twitching of the eyes and facial muscles.

I immediately made the diagnosis of chorea, and referred the case to Dr. Flora L. Aldrich for treatment, who confirmed my diagnosis, and in less than two weeks a general violent chorea supervened. Carefully and thoroughly the prescribed treatment was carried out. The little girl improved at the end of four months in every way except the facial spasm, which was worse than at the beginning of the treatment. The etiology had been carefully looked into, and there was no history of hereditary chorea, rheumatism, infectious disease, injury or fright, and all conditions whereby a possible reflex spasm could occur except that of the eyes, and discouraged at the result after so much study and careful treatment, the Doctor referred her back to me for an examination of the eyes to ascertain if possibly there could be present ocular defects sufficient to keep up this marked facial spasm.

Skeptical in regard to ocular troubles causing chorea, I proceeded to make the requested examinations, and found a slight hyperopic astigmatism of 0.5 D. She did not complain of headache, could see well, and had never had any trouble with her eyes except the conjunctivitis above alluded to. Reluc-

tantly I prescribed cylindric glasses and discontinued all other treatment.

In less than two weeks there was scarcely any spasm of the facial muscles, and in two months the little patient had entirely recovered. I see her frequently and do not observe any choreic movements. She still wears the correction given her, but as yet has not returned to school. In my opinion the ocular defect was the cause of the chorea, and the cylinders the cure.

ANALYSIS OF THE RELATIONS OF THE DOUBLE IMAGES IN PARALYSIS OF THE OCULAR MUSCLES.

By GEORGE T. STEVENS, New York

The procedure of determining, in case of paralysis of one or more of the eye muscles, causing diplopia, the exact muscle at fault, is often a source of perplexity to the oculist. Especially is this the case when one of the four oblique muscles is the seat of the affection.

In the following table of analysis of the relative positions of the double images, in case of paralysis of a single muscle only, I have attempted to condense the various phenomena of diplopia, into a few easily remembered principles.

By means of this formula, one may quickly establish a diagnosis so far as the relation of the double images is concerned.

GENERAL SCHEME OF DIPLOPIA IN PARALYSIS OF THE OCULAR MUSCLES.

Diplopia caused by lateral rotation in the median plane:

Images homonymous, paralysis of the exturnus of the eye toward which the rotations cause the greatest separation of the images.

Images crossed, paralysis of the inturnus of the eye toward which the rotations cause the least separation.

Diplopia induced by vertical rotations above the median plane:

The highest image belongs to the affected eye.

Images homonymous, paralysis of the inferior oblique of that eye.

Images crossed, paralysis of the superior rectus of that eye.

Diplopia induced by vertical rotations below the median plane:

The lowest image belongs to the affected eye.

Images homonymous, paralysis of the superior oblique.

Images crossed, paralysis of the inferior rectus.

Co-existing exophoria of sufficient degree may cause the images in paralysis of the obliques to become crossed, and esophoria, in a like manner may cause the images in paralysis of the superior and inferior recti to become homonymous.

In such case diagnosis may be aided by the tilting of the images. If the tilting of the upper end of one image inward increases with the rotation above or below the median plane, paralysis of the rectus muscle is suggested.

If the tilting of the upper end outwards increases with the rotation above or below the median plane, paralysis of one of the obliques is suggested.

In all cases of paralysis of eye-muscles, the restriction of rotation of an eye in either direction is, of course, to be regarded as of primary importance in the diagnosis.

33 W. 33d St.

THE OPHTHALMIC RECORD,

PUBLISHED MONTHLY.

● SUBSCRIPTION PRICE, INCLUDING POSTAGE, \$2.00 PER ANNUM IN ADVANCE. ●

ADDRESS ALL COMMUNICATIONS TO

G. C. SAVAGE, M.D., Editor and Publisher.

621¹/₂ CHURCH STREET, NASHVILLE, TENN.

American Medical Association.

The San Francisco Meeting has come and gone, and there are many reasons for believing that it was a pleasant and profitable one. The next meeting will be held in Baltimore, and Dr. J. J. Chisolm, well known to all our readers, is chairman of the committee on arrangements. We can very safely predict this far ahead that those who may attend that meeting will be well cared for.

We had expected to be able to publish in this issue a brief report of the work done in the Section of Ophthalmology, but the representative of the RECORD, from one cause or another, has failed in the duty assigned. Being a young man, he most likely found the California young ladies so pretty and entertaining that most of his time was devoted to them. So all we can publish about the Section is what has been published relative to its organization for another year. Dr. Edward Jackson, of Philadelphia, is Chairman of the Section, and Dr. H. V. Wurdemann, of Milwaukee, is Secretary. These two confreres will undoubtedly exert themselves to make the next meeting one of the best.

The next issue of the RECORD will contain Dr. Price's report of the scientific work done in the Section of Ophthalmology at

San Francisco, and later we hope to be able to publish abstracts of some of the papers read. We are sorry to have to state that we have been disappointed in our efforts to secure a full report of the discussions for publication. Though disappointed so far we are still making efforts in the direction of obtaining them. If the scientific work of the Section is not shown up in the *RECORD* this year as in the years that have gone, we will not be to blame.

Volume IV. of the Record

Begins with this issue. That good has been accomplished by the three volumes that have already appeared is evident. Many letters, from men capable of passing judgment, have commended the practical nature of the *RECORD*. Contributors have been kind both to the editor and to the readers, by both of whom their contributions have been appreciated. The material for publication has been abundant, and the prospects are that there will be no falling away in that line. That the good work may continue, we earnestly solicit such papers for publication as have for their aim the advancement of the science and practice of Ophthalmology; and we promise as speedy an appearance in print as may be possible. Any paper setting forth the results of original investigation, and for which the author's claim for credit should be speedily presented, will appear in the issue following its receipt. Any writer who may wish to controvert the teachings of any contributor will receive respectful consideration. The *RECORD* aims at the confirmation of what is true, and the refutation of what is erroneous. The writer who presents a truth deserves but little more than the one who opposes error.

As will be seen this issue of the *RECORD* appears in new type. The size of the journal will continue the same—forty pages of reading matter in every number—and the subscription price will remain two dollars.

Anomalies of Refraction and of the Muscles of the Eye.

The above is the title of a book of 300 pages by Dr. Flaval B. Tiffany, of Kansas City, Mo., recently published by the

Hudson-Kimberly Publishing Company of that city. While the author does not claim that he attempted to treat exhaustively the subjects of ametropia and heterophoria, he has, nevertheless, given us a volume that contains a great deal. The beginner in ophthalmology will find it helpful; and the one long in the practice of this branch of medical science will find that his memory of the principles involved will be refreshed as he reads. Many of the illustrations serve a good purpose. Some mistakes exist in the text, which have been kindly pointed out by other reviewers, and no doubt the second edition will show them corrected.

Some one has truthfully said that the whole subject of errors of refraction will have to be re-written; and the same might have been said of heterophoria. A new book devoted to an exhaustive discussion of these two subjects would have a great sale, and if properly written would make the author immortal.

Dr. W. T. Briggs.

The death of Dr. W. T. Briggs, which occurred in this city on June 13, 1894, has taken from the ranks of the medical profession one of America's greatest surgeon's. At the time when surgery included everything he was an expert operator on all parts subject to surgical skill, including the more delicate operations on the eye. He continued to do successfully the operation of extraction of cataract until about ten years ago, and gave the operation up then, not because of an unsteady hand, but because he considered that the oculist ought to be better qualified for such operations than the general surgeon.

The Eye and Ear Clinic.

Is the name of a new quarterly soon to be issued by Dr. Tiffany, of Kansas City. This will make the eighth journal devoted largely to the eye, published in English. Of these more than one-third have their home in one State—Missouri. We wish this new candidate for the favor of oculists well.

DEPARTMENT OF

Otology, Laryngology and Rhinology.

GEO. H. PRICE, M.D., EDITOR,
621½ Church Street, Nashville, Tenn.

TANSLEY'S CUT TO PREVENT MASTOID TROUBLE.

By Wm. D. BABCOCK, A. M., M.D.

Professor of Laryngology and Rhinology, Medical Department of the University of Southern California.

Schwartz, in 1868, recommended paracentesis of the membrana tympanum in cases of acute inflammation of this structure, in which it takes on rapidly great swelling, and a dark bluish-red color in the posterior upper segment, and in which there is great pain that the usual remedies cannot relieve.

Bryant in his articles on the topography of the Normal Human Tympanum, Archives of Otology, vol. xix, page 217, and Blake's article on the Reduplication of the Tympanic Mucous Membrane, vol. xix, page 209, show how a very little swelling of these parts or folds will shut off the upper part of the drum cavity from the lower. Clinically it is a truth that inflammations of the lower part of the drum cavity with perforations do well with little or no treatment, while with inflammation of the upper cavity we have the long persistent suppurative process difficult to control. It is on account of the sequellae of the inflammations in this part of the drum cavity that we have had in the last few years so many operations suggested for the removal of the bones of the ear, with the single exception of the sclerotic

condition, in which case there is neither perforation or suppuration. The inflammation being confined to the upper posterior segment, the history is about this: The folds of the mucous membrane become swollen shutting off the upper part from the lower, the tension of the upper part increases, and as the upper and posterior part of the cavity (the attic) is bone, the flaccid membrane or superior portion of the Tympanum bulges outwards making a swelling like a miniature breast. The muco-periosteum being thin becomes loosened from the bone and the inflammatory process extends in all directions, but mostly along the upper and posterior part of the external meatus. The swelling fills almost the cavity of the external meatus. Thus we have a periostitis. The examination shows the upper part of the drum membrane swollen, and of a dark red color. The upper part of the external meatus sometimes is also swolled, so much so that the tympanum is hid from view. In some cases the swelling can be lifted up with a probe away from the membrane. The swelling has the looks of a small red polyp; in fact, in one case it bulged so that I snared a piece away. The lower part of the drum membrane has the appearance of being indrawn, and has usually a pink color which is caused by the inflamed mucous membrane of the cavity showing through. Having in these cases a true periostitis the indications are plain. Relieve the tension. It is the cut advocated by Dr. J. O. Tansley of the Manhattan Eye and Ear Infirmary in these cases that caused me to head my paper as I have. Most of the writers say, puncture only. Pommery, Ed. 1883, page 222, advises making a cut of not over $\frac{1}{8}$ inch in length. Gruber, 1st Ed., says: "The incision must not be made too small." Dr. Tansley advises the use of a Graefe's Indectomy knife, and to make the puncture in the upper and posterior quadrant pushing the knife in until you feel the bone on the rear wall of the tympanic cavity, then depress the handle and cut outward for at least $\frac{3}{4}$ inch keeping the point of the knife against the bone all the time. This

brings the incision well into the external meatus and almost the whole length of the bony portion. In every case denuded rough bone will be found. Dr. Tansley claims, and I agree with him, that the invasion of the mastoid cells can be prevented by this large cut in a large number of cases. Dr. Tansley has a much smaller per cent of mastoid cases to his credit in the records of Manhattan than any of the other ear men there. I can testify to the ease of making the cut, the relief of pain to the patient, and to the rapid stopping of puss formation.

Read at the California State Society Los Angeles, Cal., April, 1894.

A CASE OF ANTRECTOMY FOR THE RELIEF OF CATARRHAL DEAFNESS.

By W. H. BATES, M. D., New York.

Politzer, in his work on the ear, makes the statement that in chronic suppuration of the middle ear the mastoid cells are usually diseased. If chronic suppurative catarrh can extend to the mastoid, the same thing may occur in chronic dry catarrh. Lane in Knapp's Archives of Otology, Vol. xxi, No. 2, page 118, recommends antrectomy as a treatment for chronic purulent otitis media and records good results. If antrectomy was beneficial in suppurative otitis, it might be also beneficial in catarrhal otitis—and so the operation was performed.

September 1st, 1891, the patient was first seen. The patient was a widow, aged thirty-three, who had complained of progressive hardness of hearing since she was 15 years old. She had ear ache at times. Right watch $\frac{12}{48}$, left watch $\frac{9}{48}$. Politzeration improved the hearing. Bone conduction was better than aerial conduction in both ears. She had no tinnitus. The nose was open on both sides. Both drum membranes were sunken. The malleus handle was displaced backward in both ears, more decidedly in the left ear. The patient was treated by applica-

tions of nitrate of silver to the vault of the pharynx to relieve the eustachian catarrh. Politzeration was also employed.

September 30th, right watch $\frac{38}{48}$, left watch $\frac{20}{48}$. Has tinnitus in both ears. Hearing improved by scraping the vault of the pharynx.

May 9th, 1892, Right watch $\frac{34}{48}$, left watch $\frac{30}{48}$. Hearing was worse after inflation. The tinnitus was less.

July 12th, Antrectomy was performed under ether on the left mastoid. The incision through the skin was about an inch long and was made $\frac{1}{4}$ from the junction of the auricle to the bone. The antrum was opened close to the external auditory canal. The size of the opening was half an inch in its horizontal diameter and about one quarter of an inch in its vertical diameter. The outer table of the antrum was thin. The antrum cavity was quite large and the cells perfectly dry. The posterior wall of the external auditory canal was removed down to the level of the drum membrane and the cavity of the antrum made continuous with the external auditory canal. Antisepsis was not strict. The hemorrhage was slight. The patient stood the operation well. Time of the operation was one and a half hours. The wound was packed with bichloride gauze and vaseline after dusting on the wound powdered iodoform. The usual bandage was applied.

July 17th, Removed the dressing. The skin wound had nearly closed and had to be reopened with scissors. There is some oozing of blood from the external auditory canal and from the opening in the antrum. The wound feels slightly sore. Tinnitus has annoyed her slightly in the right ear. She has no tinnitus in the left ear. The left ear feels stuffy and the hearing is poor. The same dressing was reapplied.

The patient was seen about three times a week. The wound healed without suppuration—the discharge was never offensive. The antrum cavity was filled by profuse granulations.

September 23rd, Right watch $\frac{10}{48}$, left watch $\frac{12}{48}$. The left ear feels more open, and hearing for conversation is improving. No treatment of the throat or inflation since the operation. Tinnitus is present only in the right ear. The wound is closing.

November 28th, Right watch $\frac{18}{48}$, left watch $\frac{24}{48}$. The left ear has better hearing than the right. The wound has entirely closed.

The patient was seen at irregular intervals. The improvement in the hearing of the left ear did not continue. Treatment of the throat and inflation were resumed.

September 25th, 1893, Right watch $\frac{20}{48}$, left watch $\frac{12}{48}$. After inflation the hearing is better in both ears. The tinnitus is constant in the right ear and occurs irregularly in the left ear. The scar which resulted from the healing of the incision behind the auricle is not noticeable. There is a shallow depression where the bone was removed.

CONCLUSIONS.

1st. The first effect of the operation was to lower the hearing.

2nd. The hearing was decidedly improved after healing had taken place.

3rd. The operation did not improve the hearing permanently.

64 East Fifty-eighth St.

New Truths in Ophthalmology,

AS DEVELOPED BY

G. C. SAVAGE, M. D.,

NOW READY.

The book is divided into three parts, as follows:—

PART I.

New Truths in Ophthalmology.

CHAPTER 1.—The Harmonious Symmetric Action of the Oblique Muscles in all Cases of Oblique Astigmatism (with addition).

CHAPTER 2.—Insufficiencies (symmetric and non-symmetric) of the Oblique Muscles and how to correct them (with addition)

CHAPTER 3.—Rhythmic Exercise the Proper Method of Developing the Ocular Muscles (with addition).

CHAPTER 4.—The Relationship between the Centres of Accommodation and Convergence.

CHAPTER 5.—The Law of Projection (Direction) and the Artificial and Natural Causes that Modify it

CHAPTER 6.—The Monoscopter (improperly called the Horopter.)

PART II.

Contributions to Old Studies.

CHAPTER 1.—Heterophoria: A Safe Line Drawn between operative and non-operative cases; and the author's method of operating. (This last part is an addition to the paper as originally published.)

CHAPTER 2.—Reason for suspending the accommodation by mydriatics in the work of refraction.

PART III.

New Operations and Modifications of old Operations.

1.—Artificial pupil through the center of soft cataract.

2.—Operation for entropion and trichiasis.

3.—Operation for pterygium, designed to prevent its return.

4.—Muscle shortening versus muscle advancement.

5.—Operation for shortening the palpebral fissure.

The book contains 152 pages, is bound in cloth and will be sold for \$1.50 per copy.

MEDICAL DEPARTMENTS



University of Nashville and Vanderbilt University.

William H. Payne, LL.D., Chancellor of the University of Nashville.
J. H. Kirkland, LL.D., Chancellor of Vanderbilt University.

THOMAS L. MADDIN, M.D.,
Professor of Principles of Medicine and General Pathology.

WILLIAM L. NICHOL, M. D.,
Professor of Practice of Medicine and Clinical Medicine.

JOHN H. CALLENDER, M.D., Ph.D.,
Professor of Nervous Diseases and Forensic Medicines.

THOMAS MENEES, M.D.,
Professor of Obstetrics.

JAMES M. SAFFORD, Ph.D., M.D.,
Professor of Chemistry.

CHARLES S. BRIGGS, M.D.,
Professor of Surgery.

G. C. SAVAGE, M.D.,
Professor of Diseases of the Eye and Ear.

WILLIAM G. EWING, M.D.,
Professor of Materia Medica and Therapeutics.

RICHARD DOUGLAS, M.D.,
Professor of Diseases of Women and Clinical Gynecology.

G. R. ATCHISON, M.D.,
Professor of Dermatology and Venereal Diseases.

S. S. CROCKETT, M.D.,
Professor of Anatomy and Histology.

AMBROSE MORRISON, M.D.,
Professor of Physiology.

LARKIN SMITH, M.D.,
Lecturer on Histology and Demonstrator of Microscopy.

E. A. RUDDIMAN, M.D.,
Lecturer on Pharmacology and Demonstrator of Chemistry.

GEORGE H. PRICE, M.D.,
Lecturer on Diseases of the Nose and Throat.

J. W. WATERS, M.D.,
Lecturer on Experimental Physiology.

S. S. BRIGGS, M.D.,
Demonstrator of Anatomy.

W. H. WITT, M.D.,
Assistant Demonstrator of Anatomy.

O. H. WILSON, M.D.,
Demonstrator of Surgery.

All communications asking information should be addressed to

W. G. EWING, M.D., Secretary,

504 Church Street.

NASHVILLE. TENNESSEE.

J. FEHR'S

COMPOUND

"TALCUM BABY POWDER,"

—THE—
 ..HYGIENIC DERMAL POWDER..
 —FOR—
INFANTS AND ADULTS.

Originally investigated and its therapeutic properties discovered in the year 1868, by Dr. FEHR, and introduced to the Medical and the Pharmaceutical professions in the year 1873.

COMPOSITION: Silicate of Magnesia with Carbolic and Salicylic Acids.

PROPERTIES:—Antiseptic, Antizymotic and Disinfectant

Useful as a GENERAL SPRINKLING POWDER, with positive Hygienic, Prophylactic and Therapeutic properties. Good in all Affections of the Skin.

Per BOX, plain, 25 cts. Per DOZEN, plain, \$1.75
 " perfumed, 50 cts. " perfumed, 3.50

Sold by the Drug Trade Generally.

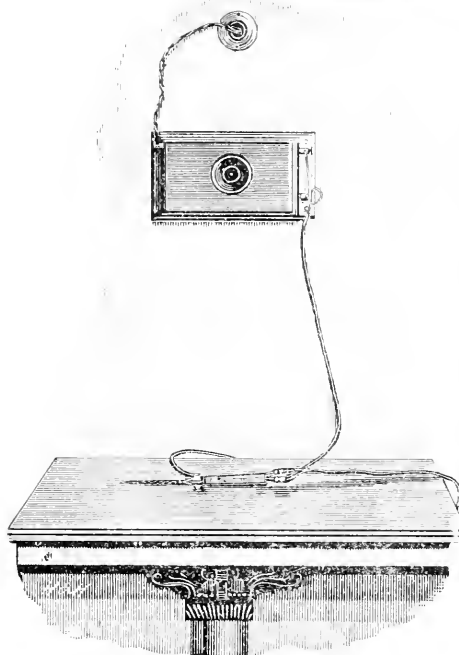
Manufacturer:

JULIUS FEHR, M. D.,

Ancient Pharmacist,

HOBOKEN, N. J.

Only advertised in Medical and Pharmaceutical prints.



An Efficient Apparatus for Operating the Electric Cautery without the Use of Battery.

The Wotton transformer (or Converter) for the utilization of the ordinary 50 or 52 volt alternating house lighting current for cautery purposes. It transforms the above mentioned current into one exactly suitable for cautery operation, as well as for the lighting of small incandescent lamps. It gives for all purposes any voltage from 0 to 8 which can be varied with perfect ease to as fine a degree as one ten thousandth of a volt by the operator at any time.

This is the apparatus referred to by Dr. Arthur G. Hobbs, of Atlanta, Ga., in his article entitled "The simplest and most practical electrical apparatus," in the November number of the *Ophthalmic Record*.

Price of transformer adapted for 50 or 52 V. alternating current \$35.00 net. In either mahogany or quartered oak case. Special transformers made to order at 10% advance.

FOR SALE BY

D. G. BLACK.

18 Courtland St., N. Y.

JAS. A. WOTTON.

P. O. Box 218, Atlanta, Ga.

B. H. Stief Jewelry Co.

JAMES B. CARR, Manager.

208 and 210 Union Street, Nashville, Tenn.

The Largest, Richest, Choicest Stock to be found in the South.

Diamonds, -:- Watches,

A Full Line of the Best American.

Sole agents for the celebrated Patek, Phillips & Co.'s Swiss Watches. Sterling Silver and Fine Silver-plated Ware. Clocks, Bronzes, Onyx-top Tables, Fine Lamps, Novelties for Weddings and Birth-day Gifts.

Repairing a Specialty, and all work Warranted. Prompt and careful attention to all orders.

VAUGHN & PARTEE,

DRUGGISTS and CHEMISTS,

Cor. Church and Vine Streets, Nashville, Tennessee.

We keep for sale by retail and in unbroken packages, the Sulphate of Eserine, Hydrobromate of Homatropia and Murate of Cocaine, in fact all rare Chemicals used in Ophthalmic practice.

Benzoinol, Benzoinated Abolene, Liquid Abolene, Menthol and Eucalyptol so commonly used in the treatment of catarrhal troubles, constantly on hand. The best atomizers, including the DeVilbiss and the McKesson & Robbins, for sale. All kinds of surgical dressings kept in stock.

Orders From A Distance Will Receive Prompt Attention.

DEMOVILLE & CO.

PRESCRIPTION DRUGGISTS,

OPEN ALL NIGHT.

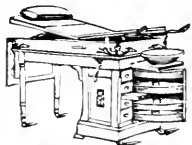
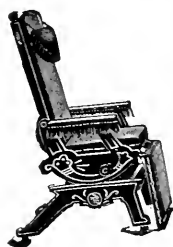
All the Rare Chemicals and Alkaloids in Stock. Atomizers, Inhalers, Insufflators, Nasal and Ear Syringes, Eye Baths, Etc., Etc. Liquids in quantities NOT EXCEEDING FOUR OUNCES can now be sent by mail, so that orders from a distance can be promptly filled.

DEMOVILLE & CO., Nashville, Tenn.

HIGHEST HONORS AT CHICAGO

THREE MEDALS WITH DIPLOMAS AWARDED

THE "PERFECTION" PHYSICIANS CHAIRS, TABLES AND CABINETS



Miner & Elberg

MANUFACTURERS

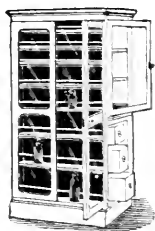
19-21 JOHN STREET

INDIANAPOLIS, IND.

Prices and Terms on Application.

ROLLING CHAIRS, DESKS, ETC.

For Sale by all Leading
Instrument Dealers



PHYSICIANS CHAIRS

PHYSICIANS and SURGEONS TABLES

PHYSICIANS CABINETS

PHYSICIANS DESKS

INVALID RECLINING CHAIRS

INVALID ROLLING CHAIRS

PROVIDENCE, R. I., Nov. 9th, 1891.

MESSRS. MINER & ELBERG, Indianapolis, Ind.

GENTLEMEN:—We enclose check for the table sold. We have three customers on the string for your Tables, which we consider rather superior to any that we have yet seen, which opinion seems to be confirmed by the physicians who are certainly giving it their preference. Very truly yours,

OTIS CLAPP & SON.

The Chair gives great satisfaction to me, and we are well pleased with it. We have never wanted a position that we could not get in it. We cheerfully recommend it to the profession.—NANKIVEL & ROGERS, Athens, Tenn.

I speak a good word for your Chair on every occasion.—G. C. SAVAGE, M. D., Nashville, Tenn.

"The Chair is all right, well deserves the name 'Perfection,' for I believe it is as near perfect as it is possible to make them."—PROF. E. ANTHONY, M.D.

Your Surgical Table reached me to-day. Enclosed find money order for \$20.00 to credit on my account, which says for itself that I am well pleased with it.—DR. J. R. FREEMAN, Minneapolis, Minn., April 12th, 1892.

F. A. HARDY & CO.,

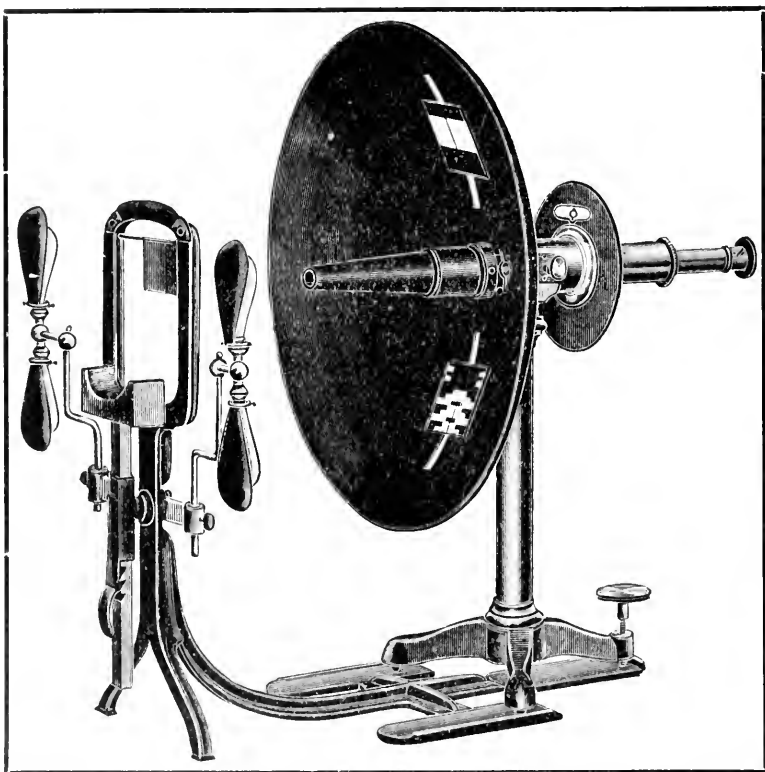
Manufacturing Opticians.

DEALERS IN

Artificial Eyes, Trial Sets, Ophthalmoscopes,

Oculists Trial Sets.

Hardy's Improved Javal Ophthalmometer.

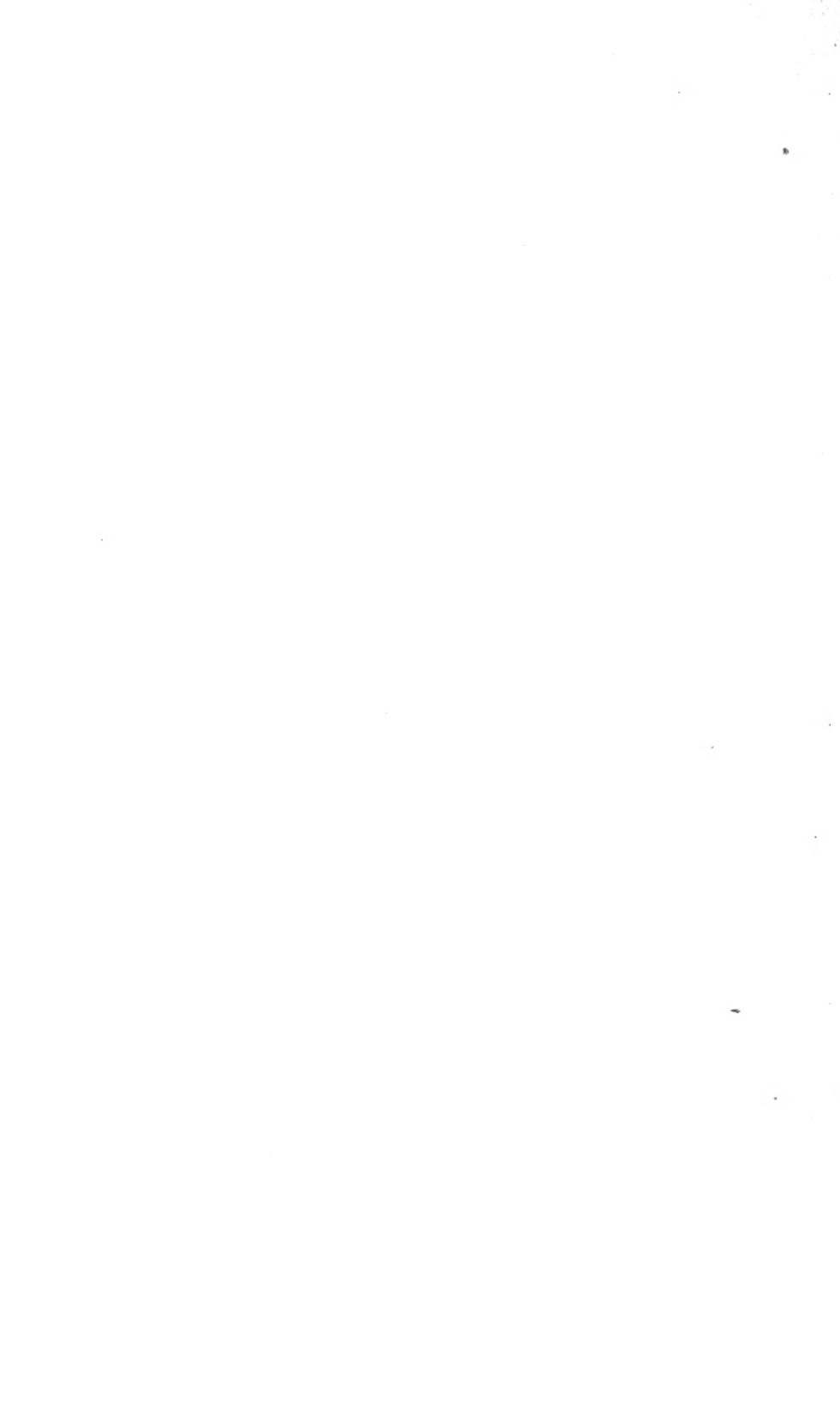


PRICE \$75.00. With 4-16 Candle Power Electric Lights, \$82.50 less 6% Cash Discount. Points of Superiority. **Definition**—Centering, Accuracy, Simplicity. Can be used in ordinary day-light without electric light.
✉ Send for Descriptive Circular.

OCULIST'S R

Our R Department is thoroughly organized and equipped, so that in accuracy, promptness, quality of workmanship we are unsurpassed. Send for catalogue and R blanks to

46 and 48 MADISON ST., CHICAGO, ILL.



Do You Know

THAT the Nashville, Chattanooga & St. Louis Railway runs Pullman Drawing Room Buffet Sleeping Cars between Nashville and Jacksonville, Florida, without change via. Lookout Mountain, Kennesaw Mountain, Atlanta, Macon, and Lake City? The "DIXIE FLYER" leaves the Union Depot, Nashville, at 7:30 a.m., every day, carrying Pullman Drawing Room Sleepers through to Florida.

THAT the N. C. & St. L. R'y, in connection with L. & N. R. R., runs Pullman Buffet Sleeping Cars between St. Louis and Atlanta without change, in both directions, leaving St. Louis in morning, leaving Nashville at night, and arriving Atlanta in morning? This is many hours the quickest line between the Northwest and Southeast.

THAT the N. C. & St. L. R'y, runs Palace Day Coaches from Atlanta, Chattanooga and Nashville to Memphis, and Pullman Palace Sleeping Cars Nashville to Memphis via. "McKenzie Route," making connection at Memphis with fast trains for Arkansas and Texas? This is many miles the shortest line to Texas, Arkansas, and Southwest.

THAT the N. C. & St. L. R'y, runs Local Pullman Palace Sleeping Cars between Nashville and Chattanooga on the night trains in both directions, which can be occupied by passengers at either place from 9.00 p.m., to 7.00 a.m.? This is a great convenience to the traveling public. Solid vestibule trains each way between Nashville and Atlanta, at night.

For full and reliable information, through tickets, berths in Pullman Cars, maps, rates, etc., apply to or address,

W. W. KNOX. Ticket Agent.

UNION DEPOT.

W. L. DANLEY.

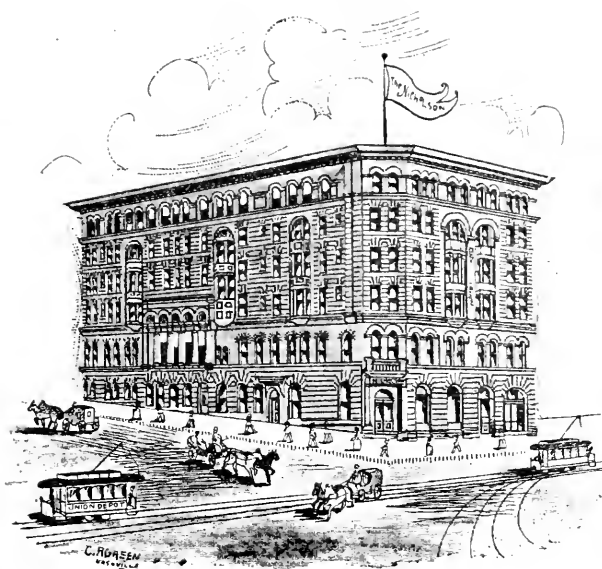
Gen. Pass. and Ticket Agt.

A. H. ROBINSON. Ticket Agent.

MAXWELL HOUSE.

W. F. MARCH,

Ass't. Gen. Pass. and Tkt. Agt.



The Nicholson House.

✱ Corner of
Church and
Spruce Sts.

Nashville,
Tenn.

The Old Nicholson so long an "old land-mark," has been replaced by the present new and beautiful structure. It is first-class in every respect and is therefore the very place for Doctors to stop when visiting Nashville. It is two squares from the Union Depot, and three squares from State Capitol. Rates \$2 to \$3 per day.

J. B. HANCOCK, Manager.



HYDROZONE

IS THE STRONGEST ANTISEPTIC KNOWN.

Bacteriological experiments made upon cultures demonstrate that: one cubic centimetre of Hydrozone is, for its Bactericide Power, equivalent to three cubic centimetres of a solution containing 3% of Bichloride of Mercury.

CURES DISEASES CAUSED BY GERMS:

DIPHTHERIA, SORE THROAT, CATARRH, HAY FEVER, LA GRIPPE,—OPEN SORES: ABSCESSSES, CARBUNCLES, ULCERS,—INFECTIOUS DISEASES OF THE GENITO-URINARY ORGANS,—INFLAMMATORY AND CONTAGIOUS DISEASES OF THE ALIMENTARY TRACT: TYPHOID FEVER, TYPHUS, CHOLERA, YELLOW FEVER,—WOMEN'S WEAKNESSES: WHITES, LEUCORRHEA,—SKIN DISEASES: ECZEMA, ACNE, Etc.

SEND FOR FREE BOOK GIVING FULL INFORMATION.

PHYSICIANS REMITTING 25 CENTS POSTAL ORDER WILL RECEIVE FREE SAMPLE BY MAIL.

PRESCRIBE ONLY IN ORIGINAL UNBROKEN PACKAGES.

AVOID IMITATIONS.

Hydrozone is put up only in small, medium and large size bottles, bearing a red label, white letters, gold and blue border.

PREPARED ONLY BY

Mention this publication.

Charles Marchand

Chemist and Graduate of the "Ecole Centrale des Arts et Manufactures de Paris" (France).

SOLD BY LEADING DRUGGISTS. Laboratory, 28 Prince St., New York.